

What is claimed:

1. A method of improving or enhancing growth in an offspring from a female animal comprising the step of introducing an effective amount of a vector into cells of said female animal prior to or during gestation of said offspring, wherein said vector comprises a promoter; a nucleotide sequence; and a 3' untranslated region, under conditions wherein the nucleotide sequence is expressed and wherein said introduction and expression of said vector results in improved or enhanced growth in said offspring.

2. The method of claim 1, wherein said cells of said female animal comprise diploid cells.

3. The method of claim 1, wherein said cells of said female animal comprise muscle cells.

4. The method of claim 1, wherein said nucleic acid sequence encodes a growth hormone releasing hormone or its analog.

5. The method of claim 4, wherein said growth hormone releasing hormone is SEQ ID NO:1, SEQ ID NO:8, or its respective analog.

6. The method of claim 1, wherein said promoter comprises a synthetic myogenic promoter.

7. The method of claim 1, wherein said 3' untranslated region comprises a hGH 3' untranslated region.

8. The method of claim 1, wherein said vector is introduced into said cells of said female animal by electroporation, through a viral vector, in conjunction with a carrier, by parenteral route, or a combination thereof.

9. The method of claim 1, wherein said female animal is a human, a pet animal, a farm animal, a food animal, or a work animal.

10. The method of Claim 1, wherein said female animal is a human, pig, cow, sheep, goat or chicken.

11. The vector of Claim 1, wherein said vector is a plasmid, a viral vector, a liposome, a cationic lipid, or a combination thereof.

12. The method of Claim 1, wherein said vector is introduced into said female in a single administration.

13. The method of Claim 1, wherein said introduction occurs during the third trimester of gestation of said offspring.

14. The method of Claim 1, further comprising the step of administering to said female a ligand for a growth hormone secretagogue receptor.

15. The method of Claim 14, wherein said ligand administration is oral.

16. A method of increasing levels of growth hormone in an offspring from a female animal comprising the step of introducing an effective amount of a vector into cells of said female animal prior to or during gestation of said offspring, wherein said vector comprises a promoter; a nucleotide sequence; and a 3' untranslated region, under conditions wherein the nucleotide sequence is expressed and wherein said introduction and expression of said vector results in increased levels of growth hormone in said offspring.

17. The method of claim 16, wherein said cells of said female animal comprise diploid cells.

18. The method of claim 16, wherein said cells of said female animal comprise muscle cells.

19. The method of claim 16, wherein said nucleic acid sequence encodes a growth hormone releasing hormone or its analog.

20. The method of claim 19, wherein said growth hormone releasing hormone is SEQ ID NO:1, SEQ ID NO:8, or its respective analog.

21. The method of claim 16, wherein said promoter comprises a synthetic myogenic promoter.

22. The method of claim 16, wherein said 3' untranslated region comprises a hGH 3' untranslated region.

23. The method of claim 16, wherein said vector is introduced into said cells of said female animal by electroporation, through a viral vector, in conjunction with a carrier, by parenteral route, or a combination thereof.

24. The method of claim 16, wherein said female animal is a human, a pet animal, a farm animal, a food animal, or a work animal.

25. The method of Claim 16, wherein said female animal is a human, pig, cow, sheep, goat or chicken.

26. The vector of Claim 16, wherein said vector is a plasmid, a viral vector, a liposome, a cationic lipid, or a combination thereof.

27. The method of Claim 16, wherein said vector is introduced into said female in a single administration.

28. The method of Claim 16, wherein said introduction occurs during the third trimester of gestation of said offspring.

29. The method of Claim 16, further comprising the step of administering to said female a ligand for a growth hormone secretagogue receptor.

30. The method of Claim 29, wherein said ligand administration is oral.

31. A method of increasing lean body mass in an offspring from a female animal comprising the step of introducing an effective amount of a vector into cells of said female animal prior to or during gestation of said offspring, wherein said vector comprises a promoter; a nucleotide sequence; and a 3' untranslated region, under conditions wherein the nucleotide sequence is expressed and wherein said introduction and expression of said vector results in increased lean body mass in said offspring.

32. The method of claim 31, wherein said cells of said female animal comprise diploid cells.

33. The method of claim 31, wherein said cells of said female animal comprise muscle cells.

34. The method of claim 31, wherein said nucleic acid sequence encodes a growth hormone releasing hormone or its analog.

35. The method of claim 34, wherein said growth hormone releasing hormone is SEQ ID NO:1, SEQ ID NO:8, or its respective analog.

36. The method of claim 31, wherein said promoter comprises a synthetic myogenic promoter.

37. The method of claim 31, wherein said 3' untranslated region comprises a hGH 3' untranslated region.

38. The method of claim 31, wherein said vector is introduced into said cells of said female animal by electroporation, through a viral vector, in conjunction with a carrier, by parenteral route, or a combination thereof.

39. The method of claim 31, wherein said female animal is a human, a pet animal, a farm animal, a food animal, or a work animal.

40. The method of Claim 31, wherein said female animal is a human, pig, cow, sheep, goat or chicken.

41. The vector of Claim 31, wherein said vector is selected from the group consisting of a plasmid, a viral vector, a liposome, a cationic lipid, or a combination thereof.

42. The method of Claim 31, wherein said vector is introduced into said female in a single administration.

43. The method of Claim 31, wherein said introduction occurs during the third trimester of gestation of said offspring.

44. The method of Claim 31, further comprising the step of administering to said female a ligand for a growth hormone secretagogue receptor.

45. The method of Claim 44, wherein said ligand administration is oral.

46. A method of increasing levels of IGF-I in an offspring from a female animal comprising the step of introducing an effective amount of a vector into cells of said female animal prior to or during gestation of said offspring, wherein said vector comprises a

promoter; a nucleotide sequence; and a 3' untranslated region, under conditions wherein the nucleotide sequence is expressed and wherein said introduction and expression of said vector results in increased levels of IGF-I in said offspring.

47. The method of claim 46, wherein said cells of said female animal comprise diploid cells.

48. The method of claim 46, wherein said cells of said female animal comprise muscle cells.

49. The method of claim 46, wherein said nucleic acid sequence encodes a growth hormone releasing hormone or its analog.

50. The method of claim 49, wherein said growth hormone releasing hormone is SEQ ID NO:1, SEQ ID NO:8, or its respective analog.

51. The method of claim 46, wherein said promoter comprises a synthetic myogenic promoter.

52. The method of claim 46, wherein said 3' untranslated region comprises a hGH 3' untranslated region.

53. The method of claim 46, wherein said vector is introduced into said cells of said female animal by electroporation, through a viral vector, in conjunction with a carrier, by parenteral route, or a combination thereof.

54. The method of claim 46, wherein said female animal is a human, a pet animal, a farm animal, a food animal, or a work animal.

55. The method of Claim 46, wherein said female animal is a human, pig, cow, sheep, goat or chicken.

56. The vector of Claim 46, wherein said vector is a plasmid, a viral vector, a liposome, a cationic lipid, or a combination thereof.

57. The method of Claim 46, wherein said vector is introduced into said female in a single administration.

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58. The method of Claim 46, wherein said introduction occurs during the third trimester of gestation of said offspring.

59. The method of Claim 46, further comprising the step of administering to said female a ligand for a growth hormone secretagogue receptor.

60. The method of Claim 59, wherein said ligand administration is oral.

61. A method of increasing feed efficiency in an offspring from a female animal comprising the step of introducing an effective amount of a vector into cells of said female animal prior to or during gestation of said offspring, wherein said vector comprises a promoter; a nucleotide sequence; and a 3' untranslated region, under conditions wherein the nucleotide sequence is expressed and wherein said introduction and expression of said vector results in increased feed efficiency in said offspring.

62. The method of claim 61, wherein said cells of said female animal comprise diploid cells.

63. The method of claim 61, wherein said cells of said female animal comprise muscle cells.

64. The method of claim 61, wherein said nucleic acid sequence encodes a growth hormone releasing hormone or its analog.

65. The method of claim 64, wherein said growth hormone releasing hormone is SEQ ID NO:1, SEQ ID NO:8, or its respective analog.

66. The method of claim 61, wherein said promoter comprises a synthetic myogenic promoter.

67. The method of claim 61, wherein said 3' untranslated region comprises a hGH 3' untranslated region.

68. The method of claim 61, wherein said vector is introduced into said cells of said female animal by electroporation, through a viral vector, in conjunction with a carrier, by parenteral route, or a combination thereof.

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69. The method of claim 61, wherein said female animal is a human, a pet animal, a farm animal, a food animal, or a work animal.

70. The method of Claim 61, wherein said female animal is a human, pig, cow, sheep, goat and chicken.

71. The vector of Claim 61, wherein said vector is a plasmid, a viral vector, a liposome, a cationic lipid, or a combination thereof.

72. The method of Claim 61, wherein said vector is introduced into said female in a single administration.

73. The method of Claim 61, wherein said introduction occurs during the third trimester of gestation of said offspring.

74. The method of Claim 61, further comprising the step of administering to said female a ligand for a growth hormone secretagogue receptor.

75. The method of Claim 74, wherein said ligand administration is oral.

76. A method of increasing the rate of growth in an offspring from a female animal comprising the step of introducing an effective amount of a vector into cells of said female animal prior to or during gestation of said offspring, wherein said vector comprises a promoter; a nucleotide sequence; and a 3' untranslated region, under conditions wherein the nucleotide sequence is expressed and wherein said introduction and expression of said vector results in increased rate of growth in said offspring.

77. The method of claim 76, wherein said cells of said female animal comprise diploid cells.

78. The method of claim 76, wherein said cells of said female animal comprise muscle cells.

79. The method of claim 76, wherein said nucleic acid sequence encodes a growth hormone releasing hormone or its analog.

80. The method of claim 79, wherein said growth hormone releasing hormone is SEQ ID NO:1, SEQ ID NO:8, or its respective analog.

81. The method of claim 76, wherein said promoter comprises a synthetic myogenic promoter.

82. The method of claim 76, wherein said 3' untranslated region comprises a hGH 3' untranslated region.

83. The method of claim 76, wherein said vector is introduced into said cells of said female animal by electroporation, through a viral vector, in conjunction with a carrier, by parenteral route, or a combination thereof.

84. The method of claim 76, wherein said female animal is a human, a pet animal, a farm animal, a food animal, or a work animal.

85. The method of Claim 76, wherein said female animal is a human, pig, cow, sheep, goat or chicken.

86. The vector of Claim 76, wherein said vector is a plasmid, a viral vector, a liposome, a cationic lipid, or a combination thereof.

87. The method of Claim 76, wherein said vector is introduced into said female in a single administration.

88. The method of Claim 76, wherein said introduction occurs during the third trimester of gestation of said offspring.

89. The method of Claim 76, further comprising the step of administering to said female a ligand for a growth hormone secretagogue receptor.

90. The method of Claim 89, wherein said ligand administration is oral.

91. A method of increasing the ratio of somatotrophs to other hormone-producing cells in a pituitary gland of an offspring from a female animal comprising the step of introducing an effective amount of a vector into cells of said female animal prior to or during gestation of said offspring, wherein said vector comprises a promoter; a nucleotide sequence; and a 3' untranslated region, under conditions wherein the nucleotide sequence is expressed and wherein said introduction and expression of said vector results in ratio of somatotrophs to other hormone-producing cells in a pituitary gland in said offspring.



92. The method of claim 91, wherein said cells of said female animal comprise diploid cells.

93. The method of claim 91, wherein said cells of said female animal comprise muscle cells.

94. The method of claim 91, wherein said nucleic acid sequence encodes a growth hormone releasing hormone or its analog.

95. The method of claim 94, wherein said growth hormone releasing hormone is SEQ ID NO:1, SEQ ID NO:8, or its respective analog.

96. The method of claim 91, wherein said promoter comprises a synthetic myogenic promoter.

97. The method of claim 91, wherein said 3' untranslated region comprises a hGH 3' untranslated region.

98. The method of claim 91, wherein said vector is introduced into said cells of said female animal by electroporation, through a viral vector, in conjunction with a carrier, by parenteral route, or a combination thereof.

99. The method of claim 91, wherein said female animal is a human, a pet animal, a farm animal, a food animal, or a work animal.

100. The method of Claim 91, wherein said female is an animal selected from the group consisting of human, pig, cow, sheep, goat and chicken.

101. The vector of Claim 91, wherein said vector is a plasmid, a viral vector, a liposome, a cationic lipid, or a combination thereof.

102. The method of Claim 91, wherein said vector is introduced into said female in a single administration.

103. The method of Claim 91, wherein said introduction occurs during the third trimester of gestation of said offspring.

104. The method of Claim 91, further comprising the step of administering to said female a ligand for a growth hormone secretagogue receptor.

105. The method of Claim 104, wherein said ligand administration is oral.

106. The method of Claim 91, wherein said hormone-producing cells are selected from the group consisting of corticotrophs, lactotrophs and gonadotrophs.

107. A method for delaying birth of an offspring from a female animal comprising the step of introducing an effective amount of a vector into cells of said female animal prior to or during gestation of said offspring, wherein said vector comprises a promoter; a nucleotide sequence; and a 3' untranslated region, under conditions wherein the nucleotide sequence is expressed and wherein said introduction and expression of said vector results in delayed birth in said offspring.

108. The method of claim 107, wherein said cells of said female animal comprise diploid cells.

109. The method of claim 107, wherein said cells of said female animal comprise muscle cells.

110. The method of claim 107, wherein said nucleic acid sequence encodes a growth hormone releasing hormone or its analog.

111. The method of claim 110, wherein said growth hormone releasing hormone is SEQ ID NO:1, SEQ ID NO:8, or its respective analog.

112. The method of claim 107, wherein said promoter comprises a synthetic myogenic promoter.

113. The method of claim 107, wherein said 3' untranslated region comprises a hGH 3' untranslated region.

114. The method of claim 107, wherein said vector is introduced into said cells of said female animal by electroporation, through a viral vector, in conjunction with a carrier, by parenteral route, or a combination thereof.

115. The method of claim 107, wherein said female animal is a human, a pet animal, a farm animal, a food animal, or a work animal.

116. The method of Claim 107, wherein said female animal is a human, pig, cow, sheep, goat or chicken.

117. The vector of Claim 107, wherein said vector is a plasmid, a viral vector, a liposome, a cationic lipid, or a combination thereof.

118. The method of Claim 107, wherein said vector is introduced into said female in a single administration.

119. The method of Claim 107, wherein said introduction occurs during the third trimester of gestation of said offspring.

120. The method of Claim 107, further comprising the step of administering to said female a ligand for a growth hormone secretagogue receptor.

121. The method of Claim 120, wherein said ligand administration is oral.

122. A method of increasing milk production in an animal comprising the step of introducing an effective amount of a vector into cells of said animal, wherein said vector comprises a promoter; a nucleotide sequence; and a 3' untranslated region, under conditions wherein the nucleotide sequence is expressed and wherein said introduction and expression of said vector results in increased milk production in said animal.

123. The method of claim 122, wherein said cells of said animal comprise diploid cells.

124. The method of claim 122, wherein said cells of said animal comprise muscle cells.

125. The method of claim 122, wherein said nucleic acid sequence encodes a growth hormone releasing hormone or its analog.

126. The method of claim 125, wherein said growth hormone releasing hormone is SEQ ID NO:1, SEQ ID NO:8, or its respective analog.

127. The method of claim 122, wherein said promoter comprises a synthetic myogenic promoter.

128. The method of claim 122, wherein said 3' untranslated region comprises a hGH 3' untranslated region.

129. The method of claim 122, wherein said vector is introduced into said cells of said female animal by electroporation, through a viral vector, in conjunction with a carrier, by parenteral route, or a combination thereof.

130. The method of claim 122, wherein said female animal is a human, a pet animal, a farm animal, a food animal, or a work animal.

131. The method of Claim 122, wherein said animal is a human, pig, cow, sheep, goat or chicken.

132. The vector of Claim 122, wherein said vector is a plasmid, a viral vector, a liposome, a cationic lipid, or a combination thereof.

133. The method of Claim 122, wherein said vector is introduced into said animal in a single administration.

134. The method of Claim 122, wherein said introduction occurs during the third trimester of gestation of said offspring.

135. The method of Claim 122, further comprising the step of administering to said female a ligand for a growth hormone secretagogue receptor.

136. The method of Claim 135, wherein said ligand administration is oral.

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